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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,379	01/18/2002	Hiroshi Takekawa	3531.66126	6956

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EXAMINER

WONG, KIN C

ART UNIT	PAPER NUMBER
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2651

DATE MAILED: 12/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/051,379	Applicant(s) TAKEKAWA ET AL.	
	Examiner K. Wong	Art Unit 2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7,9,11-13,17,19 and 20 is/are rejected.
- 7) ☒ Claim(s) 8,10,14-16,18 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/27/05 has been entered.

Claim Objections

The phrase "directly couple" is not positively recited in the specification. An appropriate action is required.

Claim 21 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 21 recited the same limitations as the previous claim 16.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims (1, 9, 11-13, 17 and 19-20) are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation "a microactuator arm ... driven by said piezoelectric element as to swing relative to said main actuator arm ..." is not clear because it is contradicting to the instant drawing and the instant disclosure. The piezoelectric element is disposed near the "narrow portion" on the main arm for expansion/retraction in the main arm. The microactuator arm is indirectly driven by piezoelectric element, and, it is not directly drive by the piezoelectric element as recited in the claims. An appropriate action is required.

Claims (11-13 and 19-20) are rejected because the parent claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims (1-7, 11-13 and 19-20) are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al (6034834) in view Imada et al (6268983).

Regarding claim 1: Yoshikawa et al discloses a head actuator device in a disk drive (see figure 8 of Yoshikawa et al and also the associated descriptions of the drive component for details) for a primary resonant frequency of 100 Hz or higher and the compensation thereof (see col. 2, lines 32-40 and col. 5, lines 24-54 of Yoshikawa et al).

Although Yoshikawa et al disclose a piezoelectric subactuator (or microactuator) on the arm for fine positioning (or correction or compensation) (see col. 10, lines 30-61 of Yoshikawa et al). Yoshikawa et al fail to positively mention the piezoelectric microactuator at the front end of the main actuator arm (or the arm of the coarse actuator). Imada et al is relied upon for the teachings of the piezoelectric microactuator at the front end of the main actuator arm (as depicted in figure 21 and col. 6, lines 45-65 of Imada et al).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the arm assembly of Yoshikawa with the piezoelectric microactuator arm as taught by Imada et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to provide an improvement of the moving resolution of the head as suggested in col. 5, lines 31-45 of Imada et al.

Regarding claim 2: Yoshikawa et al teaches that wherein the main actuator includes a ball bearing fixed to the base, the ball bearing having a property of a nonlinear spring, the primary resonant frequency being set according to the rigidity of the nonlinear spring (in col. 3, lines 45-59 of Yoshikawa et al).

Regarding claims 3, 11 and 19: Yoshikawa et al teaches that wherein the rigidity of the nonlinear spring is increased by increasing a preload in the ball bearing (in col. 3, lines 49-57 of Yoshikawa et al).

Regarding claims 4, 12 and 20: the limitations of wherein the rigidity of the nonlinear spring is increased by increasing a ball diameter in the ball bearing are

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considered known because Yoshikawa et al describes the similar noted functions in col. 4, lines 7-50.

Regarding claims 5 and 13: the limitations of wherein the rigidity of the nonlinear spring is increased by increasing the viscosity of a grease used in the ball bearing are considered known because Yoshikawa et al describes the similar noted functions in col. 4, lines 52 to col. 5, line 28.

Regarding claim 6: the limitations of an elastic member provided between the main actuator and the base, the primary resonant frequency being-set according to the modulus of elasticity of the elastic member are considered known because Yoshikawa et al describes a similar noted functions in col. 11, lines 8-18.

Regarding claim 7: Yoshikawa et al teaches that wherein the primary resonant frequency is set to 150 Hz or higher (in col. 5, lines 29-46 of Yoshikawa et al).

Allowable Subject Matter

Claims (8, 10, 14-16, 18 and 21) objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

regarding claim 8: the prior art of record neither discloses nor suggests the main actuator arm has a narrow portion in the vicinity of the front end thereof, the narrow portion having a plurality of slits interdigitally arranged so as to alternately extend from the opposite side edges of the narrow portion, and the at least one piezoelectric

element includes a pair of piezoelectric elements provided on the opposite sides of the narrow portion for driving the microactuator arm or fine movements in the disk drive.

Response to Arguments

Applicant's arguments filed 10/27/05 have been fully considered but they are not fully persuasive because the arguments are directed to the newly amended claims.

Regarding Yoshikawa in remark filed on 10/27/05: applicants assert that Yoshikawa fails to teach the microactuator arm directly coupled to the front end of the main arm. Applicants are directed to the configuration of the elements 5 and 4 in figure 6 of Yoshikawa.

Regarding Imada et al in the remarks filed on 10/27/05: applicants assert that Imada et al fails to teach piezoelectric elements on the front end of the main arm. Applicants are directed to figure 21 of Imada et al.

Henceforth, the combination of Yoshikawa and Imada et al is proper.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Budde et al (6233124) and Boutaghou (6507463) are cited for microactuator that is located at the front end of the main actuator arm for slits.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Wong whose telephone number is (571) 272-7566.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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